

A Calibration Facility for Soft X-ray Missions

Completed Technology Project (2015 - 2016)



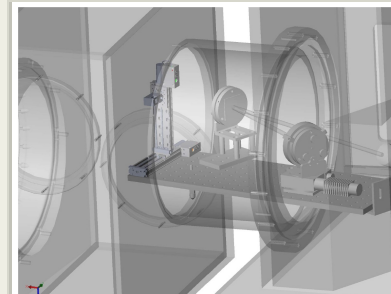
Project Introduction

This project is to extend the capabilities of the Extreme Ultraviolet Calibration Facility in the Goddard Space Flight Center (GSFC) Heliophysics Science Division (HSD), which can currently provide radiometric calibration, wavelength calibration, and spectral resolution measurements at wavelengths down to 25 nm, to include the Soft X-ray region from 0.12 to 25 nm (0.05 to 10 KeV) as well.

The objective of this task is to provide a calibration and test facility for missions to observe the soft X-ray region of the spectrum, specifically, in the wavelength range 0.12-25 nm. This provides additional capability beyond the current capability of the existing HSD facility in the Extreme/Ultraviolet (EUV/VUV) wavelength range 25-200 nm. Thus, the result will be a facility at GSFC to provide comprehensive coverage of the wavelength range 0.12-200 nm, with the capability to measure radiometric response, wavelength scale/response, and spectral resolution of high-resolution spectroscopic and imaging instruments for this wavelength range. A soft X-ray filament ("Manson") source has been obtained to produce emission lines in the 0.12-25 nm wavelength range. A set of anodes for the source provide a multitude of characteristic lines from K, L and M-shell transitions, as well as bremsstrahlung continua, at X-ray energies up to 10 KeV. This IRAD will modify the HSD EUV calibration facility to incorporate this new soft X-ray source, and will plan and execute a calibration using this new source, with NIST traceability provided by a NIST-calibrated silicon photodiode.

Anticipated Benefits

This provides additional calibration capability for the Extreme Ultraviolet Normal Incidence Spectrograph (EUNIS) and Focusing Optics X-ray Solar Imager (FOXSI) sounding rocket instruments.



An optical bench in a large ultra-high vacuum chamber provides flexibility in preparing test beams (entering from the left) for different instruments: standard sounding rocket interface (far right); translation stages for subsystems,...

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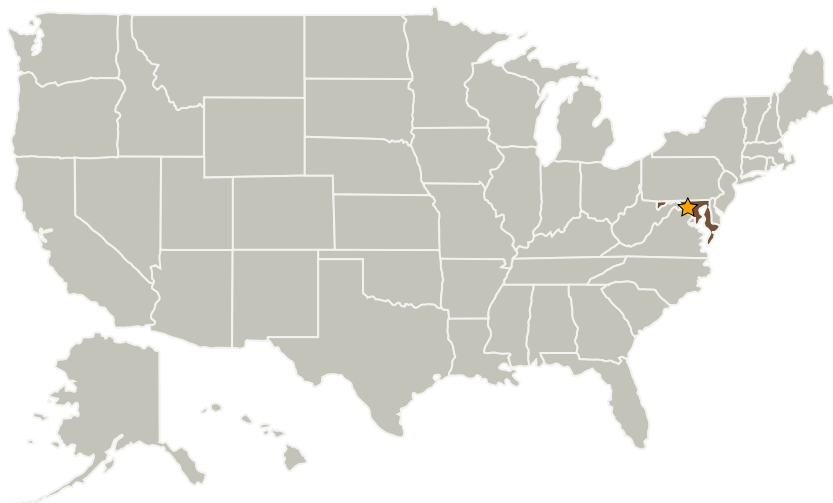
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Manager:

Nikolaos Paschalidis

Principal Investigator:

Adrian N Daw

Technology Areas

Primary:

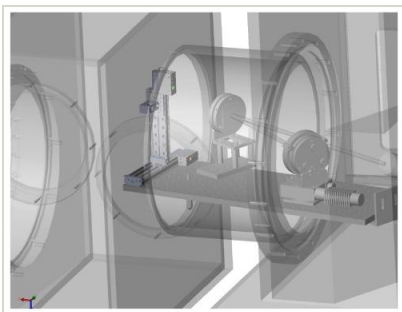
- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors

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Images



The Goddard Heliophysics Science Division EUV/soft X-ray Calibration Facility

An optical bench in a large ultra-high vacuum chamber provides flexibility in preparing test beams (entering from the left) for different instruments: standard sounding rocket interface (far right); translation stages for subsystems, CubeSats, etc.

(<https://techport.nasa.gov/image/19149>)